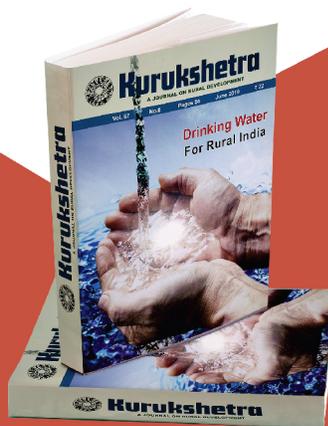


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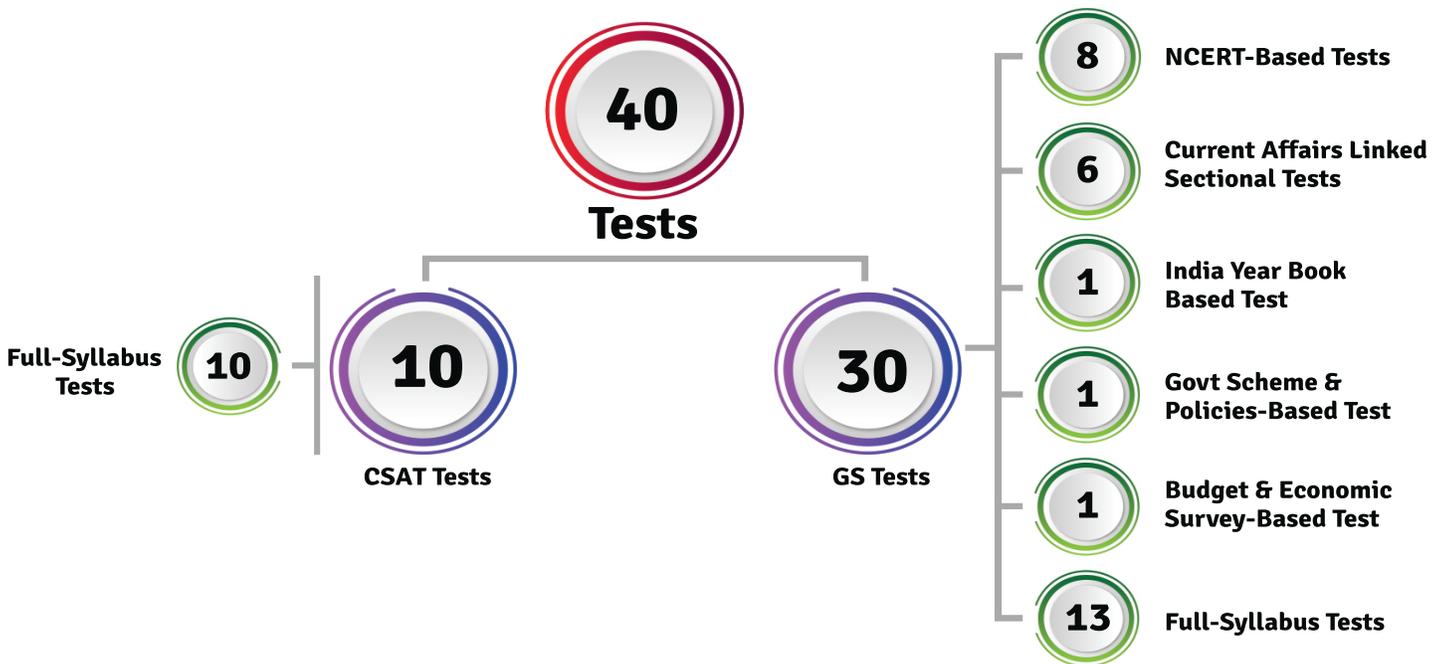


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# Kurukshetra Compendium

June 2019

## Drinking-Water for Rural India

- The non-uniformity in the level of awareness, socioeconomic development, education, poverty, practices and rituals, and water availability add to the complexity of the task. Despite an estimated total of Rs. 1,105 billion spent on providing safe drinking water since the First Five Year Plan was launched in 1951, lack of safe and secure drinking water continues to be a major hurdle and a national economic burden.
- The large investments have not yielded comparable improvements in health and other socio-economic indicators.

## Ensuring safe and adequate drinking water

- The provision of clean drinking water has been given priority in the Constitution of India, with Article 47 conferring the duty of providing clean drinking water and improving public health standards to the State.
- According to the global report 2.1 billion people live without safe drinking water at home and 80 percent of those who have to use unsafe and unprotected water sources reside in rural areas
- Rural India has more than 700 million people residing in about 1.42 million habitations spread over 15 diverse ecological regions
- In India due to a 3 fold increase in population during 1951-2010, the per capita availability of water in the country as a whole decreased from 5177 m<sup>3</sup>/year in 1951 to 1588 m<sup>3</sup>/year in 2010
- India is among the world's most water-stressed countries. Nearly countries. In 1950, India had 30004000 cubic meters of water per person. Today, this has fallen to around 1,000 cubic meters, largely due to population displace growth. Water resources are not evenly distributed. Half of India's annual precipitation falls in just 15 rain-soaked days making floods and droughts a fact of life in the country.
- The country has already spent an estimated of Rs 1,105 billion on providing safe drinking water since the First Five Year Plan launched in 1951 yet thousands of crore are still spent on controlling water-borne diseases, indicating that the problem needs to be addressed from a different perspective. India loses 73 million working days due to water-borne diseases.

## Government Initiatives

- Supply of potable drinking water has been a top priority of Central and State Governments. Constant efforts have been made in this direction starting from the Bore Committee in 1946 to Accelerated Rural Water Supply Programme (1972), and 'Swajal Dhara' scheme (1999) by empowering and involving local communities in tackling water and sanitation issues.
- In 1981, the Government of India launched the International Water Supply and Sanitation Decade (81-90) Programme with one of the targets being 100 per cent coverage of the rural and urban population with safe drinking water supply facilities.
- To supplement this effort, Technology Mission for drinking water was set up in 1986 which was renamed as Rajiv Gandhi National Drinking Water Mission in 1991. Again in 1999, the Department of Drinking Water Supply was created in the Ministry of Rural Development.
- Then came Bharat Nirman, a flagship program of the central government which created the required infrastructure to have good quality water to rural households. Rural drinking water was one of the six components of Bharat Nirman.
- During Bharat Nirman period, 55,067 un-covered and about 3.31 lakh slipped-back habitations were to be covered with provisions of drinking water facilities and 2.17 lakh quality-affected habitations were targeted to be addressed for water quality problem.
- Now, the task of providing safe drinking water in rural areas is through the National Rural Drinking Water Programme (NRDWP) which aims at assisting states in providing adequate and safe drinking water to the rural population in the country.
- In 2018-19, the scheme was allocated Rs. 7,000 crore and the Ministry are aspiring to achieve 'Har Ghar Jal by 2030, in line with the UN's sustainable development goals.

- In Financial Year 2019-20, Central Government allocated Rs. 8,201 crore for NRDWP. This is a 49 per cent increase from FY2018-19. Source of drinking water assumes great significance as it should be sustainable.

### ***Swajal Yojana***

- The Central Government aims to cover 90 per cent of rural households with a piped water supply and 80 per cent rural households with tap connections by 2022.
- A pilot project in the name of “Swajal” that is designed as a demand-driven and community-centred programme to provide sustainable access to drinking water to people in the rural areas.
- Swajal was originally launched as a pilot scheme in February 2018 in six States of Bihar, Maharashtra, Madhya Pradesh, Uttar Pradesh, Uttarakhand, and Rajasthan. Later, it was extended to all the 112 aspirational districts identified by NITI Aayog.

### ***Bhujal Yojana***

- The Central Government has also come up with a 26,000-crore World Bank-aided Atal Bhujal Yojana with community participation to ensure sustained ground water management in overexploited and ground water-stressed areas in seven states.
- It has been found that 1,034 blocks out of the 6,584 assessed blocks in the country are overexploited.
- The quality of the water supplied is also a major issue. According to one study in The Lancet 105,000 children lost their lives in 2015 to water-induced diarrhoea. Official NRDWP data reveals that around 60,000 of all habitations are exposed to water contamination by arsenic and fluoride

### **Water management through community participation**

- In March 2017, MDWS started a new sub-program under NRDWP known as the National Water Quality Sub-Mission (NWOSU).
- The sub-programme aims to address the urgent need for providing clean drinking water in already identified 28,000 arsenic and fluoride affected habitations.
- To enable the rural community shoulder the responsibility in management, operation and maintenance of water supply systems at the village level, decentralized, demand-driven, community-managed approach in the form of Swajal Dhara have been adopted.
- To further strengthen community participation in the drinking water sector for sustainability, National Rural Drinking Water Quality Monitoring & Surveillance Programme has been launched in February, 2006 under which 5 persons in each Gram Panchayat are to be trained to carry out regular surveillance of drinking water sources for which 100 per cent financial assistance including water testing kits, are provided by the Government.

### **Challenges and Future Initiatives**

- In India nearly 163 million of population lack access to clean water close to home.
- As per the report submitted by the Committee on restructuring the Central Water Commission (CWC) and the Central Ground Water Board (CGWB), 2016 if the current pattern of demand continues, about half of the demand for water will be unmet by 2030.
- Besides, climate change poses fresh challenges as more extreme rates of rainfall and evapotranspiration intensify the impacts of floods and droughts.
- Moreover, 60 per cent of our districts face groundwater over-exploitation and with 251 cubic kilometer (cu km) annual ground water extraction rate, our country is the world’s biggest consumer of groundwater
- We need many initiatives to counter the challenges in our way, to achieve our goals. Rain water harvesting is one of the most important initiatives which can help in a long way in sustaining the supply of safe drinking water in the rural areas.
- The central government is working on a master plan envisaging construction of about 23 lakh artificial recharge and rainwater harvesting structure in rural areas and 88 lakh in urban areas

### ***Some successful steps are taken in this direction***

- There are many success stories in India which draw their success from our ancient traditional knowledge and wisdom. In 2001 the Tamil Nadu government made it compulsory for each household to have rainwater harvesting infrastructure and the results are now reflected in the improvement of overall water quality within 5 years.

- A similar experiment has been tried out in the cities of Bangalore and Pune, where housing societies are required to harvest rainwater.
- There is the number of such initiatives in Uttarakhand, Kerala, Himachal Pradesh, Rajasthan, Gujarat, Maharashtra, Karnataka, and other States.
- The efforts by local communities in India to improve water availability have been lauded in a UN report that highlights the importance of finding nature-based solutions to meet global water.
- The report notes that reservoirs, irrigation canals, and water treatment plants are not the only water management instruments at disposal. It also cited the example of China's Sponge City which aims to recycle 70 per cent of rainwater.

### **Know! about beris**

- The report highlights the importance of beris, traditional system of harvesting rainwater, that have been working as lifesavers for both humans and animals in parts of western Rajasthan for centuries.
- Shaped like matkas (pitcher), these shallow wells are dug up in areas with gypsum or bentonite beds which prevent the rainwater from percolating downwards but guide them towards the wells through capillary action.

### **Way forward**

- Overexploitation of ground water is a major concern in India. There is a need for a regulatory mechanism by the State governments to check the overexploitation of this resource.
- Excess digging of wells should be avoided or restricted in severely affected areas.
- There is a need for more role of Panchayati Raj Institutions (PRIs) in making the drinking water supply schemes functional.
- Presently, the role of PRIS is minimal. The partnership between village communities, NGOs and the government as the facilitator and co-financing have worked successfully.
- Empowerment of PRIS with more resources is a viable and sustainable option for scaling up the decentralized service delivery model.
- We need to remember that to widen the access and availability of drinking water in rural areas, we need to make every effort to preserve and use the water judiciously with the active participation of the village communities.

## **Community Participation and Quality drinking water supply**

- An important component of rural infrastructure is drinking water arrangements. Meeting the drinking water needs of such a large population can be a daunting task due to the lack of installed drinking water supply capacities, low level of socio-economic development, education and awareness about the access and usage of water.

### ***Schematic interventions***

- 1949 – Bhor Committee (environment hygiene committee) advocated for the provision of safe water supply to cover 90 percent of India's population within a time frame of 40 years.
- The first-ever formal schematic intervention was initiated with the implementation of the Accelerated Rural Water Supply Programme (ARWSP) during 1972-73. While ARWSP aimed at speeding up coverage of drinking water supply, its approach towards last-mile delivery got modified by the introduction of the National Drinking Water Mission (NDWM) in 1986.
- The first-ever National Water Policy was drafted in 1987 to give a concrete direction to the approach adopted to create sustainable water infrastructure. In 1991, Rajiv Gandhi National Drinking Water Mission replaced NDWN.
- In 1994, the 73rd constitutional amendment incorporated specific provisions of entrusting the responsibility of drinking water supply to Panchayati Raj Institutions (PRIs).
- Initiatives of Government of India (GOI) witnessed scaling up of water sector reforms and the implementation of the Swajaldhara scheme to fulfill the Millennium Development Goal commitment on sustainable access to safe drinking water.
- Swajaldhara accorded priority to serving villages which did not have an adequate source of water.

- The period 2005 - 2012 witnessed the implementation of Bharat Nirman programme during which the National Rural Drinking Water Programme (NRDWP) was launched in 2009.
- The objective of NRDWP was to cover all rural habitations with safe drinking water. With effect from 2016, NRDWP was transformed into an outcome-oriented schematic intervention to ensure adequate potable water availability without undermining the importance of convenience, affordability, and equity in distributing drinking water in rural areas
- The target for providing access to drinking water to identified habitations was achieved well before March 2012 under the Bharat Nirman programme.
- Post-2012, under restructured NRDWP, the focus shifted to improving the quality of water supplied to targeted habitations.
- Studies indicate that the ever-growing dependence on groundwater and its unsustainable over-extraction are lowering the ground water table and adversely impacting the quality of rural drinking water supply.  
*The quality of water is deteriorating in rural areas due to the following major factors:*
  - (a) Rapid depletion of ground water level due to over-extraction by Agriculture and Industry Sectors
  - (b) Uncontrolled construction activities in rural areas and encroachment of the erstwhile water bodies;
  - (c) Siltation of rural water bodies and reduction of water bodies;
  - (d) Erratic rainfall and droughts or drought-like Conditions
  - (e) Water pollution due to incessant and increased use of pesticides, fertilizers, and effluents coming from industry
- A study of quality affected habitations by category of contaminants shows that as many as 4.07 crore rural population are suffering from water contamination that varies from fluoride arsenic, iron, salinity, nitrate, heavy metals, etc.

## Community & Water Quality Management

- The community's involvement enhances the economic viability of operation and maintenance, better upkeep due to inherent community belongingness and also increases the life span of the system so created
- The community has an important role in maintaining not only hygiene near the drinking water sources, but also in improving the ways and means by which water is collected and stored to avoid contamination during collection, storage, and use.
- To arrest problems of arsenic and fluoride contamination in drinking water, NITI Aayog had recommended commissioning of community water purification plants and advocated for last-mile connectivity of piped water supply schemes in 2016.
- In 2017, GoI launched the National Water Quality Sub Mission to provide safe drinking water to 27,544 arsenic/fluoride affected rural habitations in a span of four years.
- The effective implementation of these schemes demands the active engagement of community through PRIs, Self-Help Groups (SHGs) and Cooperatives in rural areas.
- Government of India aims at providing safe drinking water to 90 per cent of rural population through surface water based piped water supply schemes by 2022 as a long-term sustainable solution.
- It has outlined a strategic goal 2017-2030 to achieve 'Har Ghar Jal by 2030. This is attuned with the United Nations (UN) Sustainable Development Goal (SDG)-2030.
- The community through PRIs needs to take up the responsibility of being programme implementing agencies (PIAs) not only to plan and install drinking water projects and extract water for drinking purposes but also to treat the same, wherever required, to eradicate contamination and improve its quality as per the specified standards before supplying to the rural households.

### ***The community should ensure the following to provide safe drinking water in each rural habitation:***

- Social mobilization, initiation of need analysis, preparation of water security plan and village action plan
- Discuss and deliberate on the sustainability of drinking water schemes, explore new revenue sources like user fees, operation, and maintenance fees, etc. for smooth operation and maintenance of water systems

- Prepare a water safety plan to ensure water quality
- Ensure convergence with line departments of the district to plan and execute water conservation projects under PMKSY, MGNREGA, etc. to ensure water recharge and increased water availability in rural areas
- Set up technical support cells in consultation with the District/Block administration to ensure convergence in the community and near the project areas;
- Coordinate with District/Block level authorities for promoting timely execution of water projects and fund utilization towards improving household water connections, operation, and maintenance of piped water scheme activities and other water supply system
- Coordinate with District/Block level authorities for adopting technologies and digital medium for adopting technologies and digital medium for monitoring of water schemes
- Arranging social audit of water schemes from time to time in consultation with district line in consultation with district line department officials
- Arrange training and capacity building programmes on water collection, storage and this usage for grass root workers like ASHA workers of a Anganwadi workers, science teachers, high water school girl children, a panchayat member
- Conduct a periodic sanitary survey
- Monitor water availability, water sources, and quality of water and arrange awareness camps
- Ensure availability of water testing kit for each Gram Panchayat and regular testing of water in accredited labs
- Training a few educated community volunteers on monitoring parameters of the water system installed in the locality and disseminate in the community for better monitoring of schematic interventions

### Way forward

- Central and State Governments need to provide timely and adequate technical and financial support and an enabling environment for PRIS and local communities like SHGS and cooperatives to manage and monitor the rural drinking water sources and systems at the local level to achieve the objective of 'Har Ghar Jal'
- A shift in approach is required to 'area-specific development interventions from 'universalization of programmes/schemes'. An Independent Mapping of development status at frequent intervals is the need of the hour to identify localities within the community itself with greater developmental issues relating to the supply of safe drinking water
- This would facilitate the planning and execution of area-specific strategies to improve quality water supplies to rural households and facilitate achieving long-term goals of the government.

### The major challenge before the government is to ensure

- Safe drinking water in the slipped back habitations through the vigorous restoration of defunct bore pumps, carrying out repairs of water supply pipelines, augmentation of supply wherever required and
- Sustainability of quality water supply to areas covered under government programmes.
- The need of the hour is to go for a rigorous convergence drive of GoI's various rural development programmes, such as Mahatma Gandhi National Rural Employment Guarantee Act, Pradhan Mantri Krishi Sinchayee Yojana, other schemes for watershed development and restoration of water bodies, etc., backed by a need-based village-level water planning.

## Technology Innovations for Safe Drinking Water Supply

- Appropriate technologies and innovations can play a pivotal role in making available safe and clean drinking water to the rural population in our country.
- If technologies and innovations are equipped with the insight of traditional knowledge system of India, then drinking water supply in rural parts of the country can be realized.
- According to the World Health Organization, 84 per cent of Indians who don't have access to clean water and sanitation live in rural communities.
- As per the review of the Millennium Development Goals done by the United Nations, out of the 35 Indian states, only 7 have achieved full coverage of having a safe water source for their villages.

- Ground water in most cities and around 19000 villages contains fluorides, nitrates, pesticides, etc. beyond the permissible limits.
- Drinking water quality thus remains an issue and this reflects the fact that approximately 21 per cent of communicable diseases are waterborne and 75 per cent of water-related deaths are of infants under five years
- The decline in groundwater levels, contamination of water sources and increased consumption are some big problems related to water resources. In such a scenario, availability of safe, clean and affordable water is a big challenge
- India has the world's largest rural drinking water scheme serving some 1.6 million dwellings spread across 15 different environmental regions and 74.2 crore people. In 1999, steps were launched to institutionalize the community's participation in the implementation of rural potable water schemes

### **Water Quality: A Major Concern**

- Water quality has emerged as a major issue in the rural drinking water supply.
- The Government has launched the National Rural Drinking Water Quality Monitoring and Surveillance Programme, which institutionalized the community participation of district and state-level laboratories for the monitoring of drinking water sources at the grass root level through Gram Panchayats.
- Many public authorities are involved in the supply of rural water. Central Water Commission(CWC) regulates the use of water to irrigate surface waters, the industry, and potable water. It also mediates in disputes related to the inter-state water allocation.
- Central Groundwater Board (CGWB)monitors groundwater levels and rates of depletion and the production of water resource inventories and maps.
- National Rivers Conservation Directorate (NRCD) oversees the implementation of Action Plans to improve the quality of the rivers in India.
- Central Pollution Control Board (CPCB)promotes basin-wide pollution control strategies. It liaises with State Water Pollution Control Boards for laying down standards for the treatment of sewage and effluents. The Board is also responsible for action in the case of non-compliance by agencies
- The Ministry of Drinking Water and Sanitation is the nodal ministry for the overall policy, planning funding and co-ordination of the National Rural Drinking Water Programme (NRDWP for rural drinking water supply in the country.
- Ministry of Agriculture (MOA) deals with planning, formulation monitoring and reviewing of various watersheds based developmental project activities Central Bureau of Health Intelligence (CBHI) performs the collection, compilation, analysis, and dissemination of the information on health conditions in the country.
- Bureau of Indian Standards (BIS) is responsible for the drafting of standards about drinking water quality
- In our country, groundwater is the major source of water and around 85% of the population is dependent on it. Remaining 15 percent of the rural water supply comes from surface water sources.
- Though groundwater is less vulnerable to pollution as compared to surface water, the nature of the quality issue in groundwater is of two types.
- Firstly it is inherent in the form of contamination caused by the nature of the geological formation, e.g. excess fluoride, arsenic, brackishness, iron, etc.
- Secondly, groundwater pollution is caused by human intervention, such as the intervention of chemical fertilizers.

### ***Technology interventions for Drinking Water***

- Both human activities and natural processes cause water contamination. The technology used will depend on current water quality, future requirements, and economics.
- The technology for water treatment removes contaminants that may be organic, physical or chemical in nature. Diverse water treatment technologies are available to clean and make contaminated water suitable for human consumption by removing unwanted chemicals or biological contaminants.

### **Some of the prevalent technologies for water purification & treatment.**

- Capacitive deionization (CDI), is a technology in which a separator channel (with a porous electrode on each side) removes ions from water;
- Ozonation technique is based on the ozone infusion into the water for chemical water treatment;

- In Ultraviolet technology, ultraviolet light is used to kill micro-organisms of water;
- A large majority of contaminants are removed in reverse osmosis (RO) technology through a semi-permeable membrane;
- TERAFIL is a burnt red clay porous media used for filtration & treatment of raw water into clean drinking water. This technology has been developed by the Council of Scientific & Industrial Research (CSIR);
- Community-scale Arsenic Filter is an organic arsenic filter which is developed by the IIT Kharagpur;
- Filtration methods that may include rapid/slow and filters which remove rust, silt, dust and other particulate matter from water and
- Solar water purification systems.
- Water is used mainly in agriculture, drinking, sanitation, and industry. The majority of the reduction in the world's water tables, large rivers that run dry and increasingly saline groundwater is caused by agriculture.
- If we look at it from a world viewpoint, we clearly have no shortage of freshwater. But significant differences in geographical, climatic, seasonal and population densities in many regions of the world lead to severe scarcity.
- To provide clean water in developing countries, the technology must be efficient, affordable and simple to operate and maintain.
- In recent years, a great deal of research has been conducted to identify novel technologies for removing arsenic, particularly low cost as well as low tech systems that could be applied in rural areas.
- There are enormous global efforts under way to revamp the water sector through technology and innovation intervention.
- The increasing knowledge accumulated and shared worldwide, including India, will continue to expand these efforts.
- More and more organizations realize that it is essential to improve the water quality, health, hygiene and environment of local communities because only healthy people can act as a catalyst for further development. Hence, it is our collective responsibility to think and act logically to save water.
- At the same time, we should support the government as well as non-government agencies that are developing technological and innovative interventions to make available safe drinking water

## The revival of traditional rainwater harvesting structures

- The importance of water resource management has been recognized since ancient times.
- The importance of water resource management has been recognized since ancient times.
- While water is a renewable resource, its availability is largely determined by climatic conditions and technology that permits its exploitation and also by the efficiency with which it is conserved and used. Rainwater, which is the purest form of water, has been collected and stored for later use for centuries.
- If collected properly, it would not only provide the supply of safe drinking water but also help in combating water-borne diseases to a great extent.
- For the last three to four decades, rainwater harvesting has been getting increasing attention and in the 1980s, the era of after having been ignored earlier

### *Traditional Rainwater Harvesting (TRH)*

- Hundreds of years ago, the rulers of princely states in Rajasthan had created structures for any towns and villages rainwater harvesting, now called traditional rainwater harvesting (TRH) structures.
- These structures catered to the local needs utilized local resources and were based on the wisdom and knowledge handed down from generation to generation.
- They were replenished each year with monsoon rain and served the people all around the year. Many community TRH structures also had temples or religious associations with them and became centers of pilgrimage.
- The main THREE structures in Rajasthan, namely, kundi, kui/beri, baori/ber, jhalara, Nadi, Toba, tanka, khadin, johad and anicut are described.
- A kundi is essentially a circular underground well with a saucer-shaped catchment area that gently slopes towards the center where the well is situated.

- A wire-mesh across water inlets prevents debris from falling into the good pit. The sides of the well-pit are covered with lime and ash. Most wells have a dome-shaped cover for protection.
- A kui/beri is a 10-12 meter deep pit dug near tanks to collect the seepage. It is used to harvest rainwater in areas with meager rainfall.
- The mouth of the pit is made narrow to prevent the collected water from evaporating. The pit gets wider under the ground so that water can seep into a large surface area. The structures are generally covered with wooden planks. The water is used sparingly, as a last resort in times of crises.
- A baori/ber is a community well, whose water is used mainly for drinking. Most of these are very old, having been built by banjaras (mobile trading communities) for their drinking water needs. They are shallower than wells and have beautiful arches along with their height.
- A jhalara is a human-made tank, essentially meant for community bathing and religious rites. Often rectangular in design, it is built at a series of levels and has steps on three or four sides. It collects subterranean seepage of a lake located upstream.
- A Nadi is a small excavated or embanked village pond used for storing water from an adjoining natural catchment during the rainy season. Its depth ranges from 1.5 to 12 meters. Water availability from such source lasts from two months to a year. This practice of water harvesting is over 500 years old and in arid regions, each Village has one or more such structures. Water from these structures is generally muddy and dirty and unfit for human consumption.
- A toba is a natural ground depression within a catchment area. It is usually flanked by groves of shady trees, which helps in reducing evaporation of water. The water in the toba generally lasts for about four months.
- A tanka is a small circular or square underground tank constructed with lime mortar or cement plaster. It is normally constructed on the fallow ground where surface runoff can be diverted to the tank by creating a clean catchment all around. It is constructed either for an individual family or for a community depending upon the requirements.
- A khadin is a construction designed to harvest surface runoff water for agriculture. In this system, run-off water from uplands and the rocky surface is collected in suitable deep soil plots located in the lower valley segments of the area. An earthen bund is put in place on which trees and grasses are established. These help in stabilizing the bund and reducing evaporation losses.
- A johad is a small earthen check dam that captures and conserves rainwater, improving percolation and recharging ground water.
- An anicut is a structure constructed across a stream. It uses an earth-fill section with a spillway and is designed to hold sufficient water to submerge a substantial upstream area during the rainy season.
- The various types of TRH structures existed for centuries and catered to the essential water requirements of the people of the water-scarce state.

### ***Dysfunctional State of TRH Structures***

- In the olden days, TRH structures were considered as important assets and a thing of pride for the family.
- At the time of distribution of family wealth, TRH structures were also considered along with gold, land, and livestock.
- The control of communally-owned forests and water resources was gradually taken up by the centralized authorities.
- With the passage of time, the nature of the community changed to a great extent. The “feeling of communities got replaced by “me” or individual feeling and everybody’s concern became nobody’s concern. Over time, the community TRH structures were not owned by anyone.
- The further march of industrialization and urbanization led to the TRH structures being degraded and falling into disuse. While community TRH structures became almost defunct, the household structures remained sub-optimally utilized, even in western Rajasthan, where once upon a time these were the only source of water.

### ***The main reasons for the dysfunctional state of TRH structures are the availability of other sources of water (piped water, hand pumps, and canal water);***

- The requirement of financial resources for their use and maintenance; Requirement of time and labour to use water from these structures

- Lack of ownership and participation of the community, and;
- The tendency to disregard age-old and time tested lifestyle in favour of the latest technology in the name of modernization

### ***Revival Strategies for TRH Structures***

- As outlined above, the water scenario in Rajasthan is quite grim. On the one hand, demand is increasing due to population explosion and rapid urbanization and on the other hand, the water table is going down dangerously and more and more areas are coming under the category “grey zone”.
- There is a total mismatch between demand and supply. The old wisdom about pertaining to water conservation in the state needs to be revived. Reviving old rain water structures and giving them a face lift through modern materials and technology can solve the problem to a great extent.

### ***A few initiatives taken by various agencies in the state are outlined below***

- The work done by an NGO, Tarun Bharat Sangha (TBS) has received maximum attention. TBS has been working on the revival of johads since 1986. The NGO revived five river systems, which were dried up for the last several decades.
- TBS relied on community participation by undertaking padayatras and involving religious leaders.
- The entire work was done without relying on many engineers and guided entirely by the traditional wisdom of the people. Due to these structures, 2.5 lakh wells were recharged.
- The entire area, which was earlier classified under ‘dark zone’ got converted to ‘white zone’. Rajendra Singh, who runs the NGO, was awarded the Ramon Magsaysay award for community leadership in 2001 and the Stockholm Water Prize (known as the Nobel Prize for Water) 2015
- Another prominent NGO, Jal Bhagirathi Foundation (JBF), founded in 2002 has been working in the area of water security for the Marwar region, comprising seven districts in the western part of the state. JBF promotes the revival and construction of
- TRH structures by using inexpensive, simple and traditional technology. It has evolved a community-led water management system working through over 20,000 village level volunteers assisted by trained professional workers.
- JBF has revived or constructed over 2,000 TRH structures covering about 500 villages. It has improved water availability in the area from an average of four months to 10-12 months in a year.
- The financial sustainability and community ownership are ensured through a development fund, called Jal Kosh, in which community deposits at least 30 percent of the project cost.
- Educational and research institutions have also been involved in working for popularising revival of TRH structures.
- In the 1990s, the Central Arid Zone Research Institute (CAZRI), Jodhpur developed improved technology of tanka construction for various types of users (capacity ranging from 5000 litres for an individual family to 600,000 liters for community use) using stone masonry with cement plaster and cement concrete. The designs were accepted, replicated and widely used in thousands of tankas
- A Working Paper prepared by researchers from CAZRI for International Water Management Institute in 2005 observed that the TRH systems, prevalent for centuries in the region, are still viable and cost-effective.
- If these systems are improved and utilized on a large scale, they can meet the requirements of drinking water of the rural population and mitigate the drought impact, at least partially
- It is significant that the success of the revival of TRH structures has largely been due to the involvement of the community at large.
- Seeing the success of such efforts and concerned about the situation, in 2016, the state government launched a comprehensive scheme to ensure effective implementation of water conservation and water harvesting related activities in rural areas
- It aims to cover about 21,000 villages with 7 lakh water conservation structures in four years. By 2018, over 12,000 villages were covered and 3.8 lakh water storage structures created.
- Besides budgetary Support for the first time ever, the state government has created an online crowd-funding portal where donations for the scheme are accepted.

## What's the way forward

- The revival of TRH structures now occupies considerable importance in the policy space in Rajasthan. It has been recognized that despite the depleting water resources, the state still has significant potential for harvesting and conserving rain water.
- If an integrated water resources management approach is adopted and proper policies and investment actions are implemented using recent technologies, the problem of water scarcity can be mitigated to a large extent. Although water is available for free, it is an invaluable resource and its value needs to be understood
- However, it is important that the actions planned under various schemes must be implemented in true spirit.
- Poor management of water bodies has been the main reason for their neglect and disuse. While constructing or renovating TRH structures is necessary, it is even more important to maintain these structures properly so that their benefits can be derived for many years to come.
- For that, community participation and involvement are a must. All stakeholders, namely, government agencies, NGOs, corporate and media houses and the community at large must come together to tackle the problem of water scarcity in the state.





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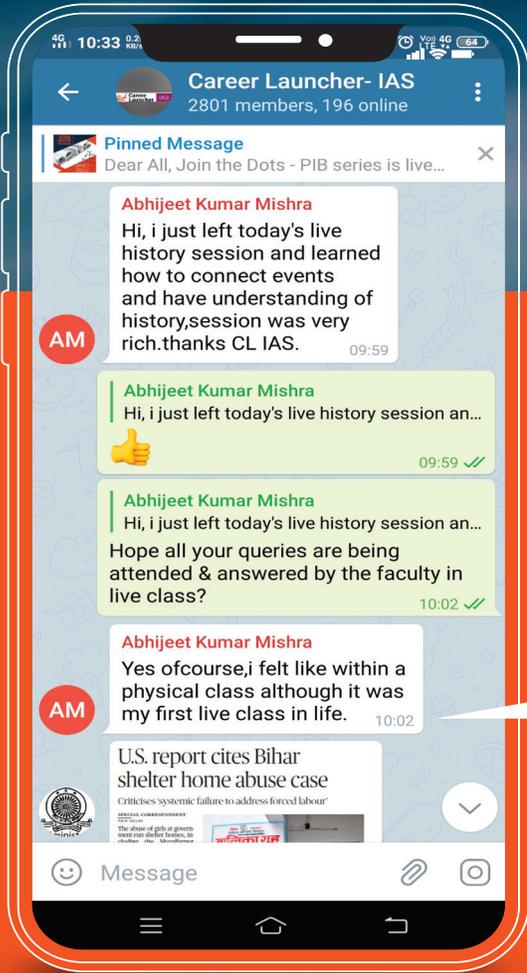


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